



Aleutian Seismic Experiment 1994

Cruise Report for R/V Alpha Helix HX-179

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Summary

This report documents cruise HX-179 of the R/V Alpha Helix, in which ocean-bottom hydrophones (OBH) and ocean-bottom seismometers (OBS) were deployed along five transects across the Aleutian Islands volcanic arc and backarc region. The scientific goal of this project is to acquire new information on the deep seismic structure, composition, and evolution of intraoceanic and continental volcanic arcs. This study was one component of a comprehensive active-source seismic study of the Aleutians, involving two ships (R/Vs Ewing and Alpha Helix) and investigators from the Woods Hole Oceanographic Institution (WHOI), University of Delaware, Lamont-Doherty Earth Observatory, University of Texas, Stanford University, and the US Geological Survey. The Ewing fired shots from its large, tuned airgun array into three sets of receivers: the Ewing's multichannel seismic streamer, ocean-bottom seismic instruments deployed from the Helix, and an array of onshore seismometers deployed by Stanford University. Twelve WHOI OBH and seven USGS OBS were deployed; in all, fifty-three deployments and fifty-one recoveries were made. One OBH and one OBS were lost (the OBS was later recovered). Due to good weather and smooth operations, the primary goal of acquiring two transects across the arc and one in the backarc was completed with sufficient time remaining to add two unplanned transects in the backarc. Apart from the two instrument losses, the experiment was a success: preliminary record sections show reflections and refractions from the whole crust and Moho on both arc-crossing profiles.

Cruise Participants



RV Alpha Helix

- **W. Steven Holbrook** - WHOI, Chief Scientist
- F. Beecher Wooding - WHOI
- Kenneth R. Peal - WHOI
- James Dolan - WHOI
- David DuBois - WHOI
- Dan Lizarralde - WHOI/MIT
- Jun Korenaga - WHOI/MIT
- VeeAnn Cross - USGS
- Dwight Coleman - USGS
- Chris Sheehan - Seward Marine Center, Univ. of Alaska

Cruise Data

There were three deployments of OBS's in this experiment with several lines shot during each deployment. The following graphics show the deployment locations for the OBS's using some of the lines recorded. The line drawn on each graphic is the navigation track of the shooting ship for the line shot specifically for OBS recording. These are interactive displays. Click the mouse button on an OBS location, and a sample data section will be displayed with the details of each deployment site. The data displayed are raw record sections of the vertical geophone from each instrument.

Aleutian OBS deployment tables

Deployment Site	OBH/S	EID #	Hyd. #	Deployment Date/Time	Latitude	Longitude	Depth(m)	Start Time	Recovery Date/Time
1	17	18	1501	7/07/94 17:58	49 59.983' N	171 31.048' W	5270	7/08/2200	Did Not Recover
2	19	19	GF-14	7/07/94 20:45	50 20.985' N	171 42.454' W	5375	7/08/2200	7/10/94 21:19
3	27	27	1503	7/08/94 00:30	50 43.132' N	171 55.069' W	5497(w/t)	7/08/2200	7/11/94 12:05
4	22	22	GF-9	7/08/94 05:02	50 59.993' N	172 03.765' W	5510(w/t)	7/08/2200	7/11/94 16:04
5	18	17	1502	7/08/94 06:53	51 14.410' N	172 11.670' W	5536	7/08/2200	7/11/94 19:26
6	C4	-	-	7/08/94 07:57	51 22.810' N	172 16.220' W	4505	7/09/0100	7/11/94 21:58
7	A1	-	-	7/08/94 09:19	51 31.200' N	172 20.790' W	3726	7/09/0100	7/12/94 00:11
8	21	21	GF-11	7/08/94 16:43	51 40.210' N	172 25.700' W	3840	7/08/2200	7/12/94 02:23
9	24	24	151	7/08/94 18:01	51 49.786' N	172 30.986' W	2530	7/09/0300	7/12/94 04:21
10	26	26	GF-8	7/08/94 19:50	51 59.884' N	172 36.599' W	128	7/09/0300	7/12/94 05:48
11	C1	-	-	7/08/94 21:19	52 10.042' N	172 42.082' W	142	7/09/0100	7/12/94 07:04
12	A2	-	-	7/08/94 06:53	51 14.410' N	172 11.670' W	5536	7/08/2200	7/12/94 08:52
13	16	16	1326	7/09/94 00:03	52 30.666' N	173 01.390' W	1060	7/09/0300	7/12/94 10:50
14	23	23	1328	7/09/94 01:45	52 41.034' N	173 11.080' W	1110	7/09/0300	7/12/94 12:48
15	C9	-	-	7/09/94 03:14	52 51.338' N	173 20.786' W	1930	7/09/1000	7/12/94 14:42
16	25	25	GF-13	7/09/94 05:03	53 01.667' N	173 30.487' W	2540	7/09/0300	7/12/94 16:50
17	20	20	1386	7/09/94 06:43	53 12.006' N	173 40.185' W	3400	7/09/0300	7/12/94 19:16

Line A1 Data

Line A1b Data

Line A2 Data

Line A3 Data

Line BA1 Data

Line BA2 Data

Line BA3 Data